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1 The mediating role of psychological need satisfaction in relationships between types of
2 passion for sport and athlete burnout.

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Abstract

Research indicates that obsessive and harmonious passion can explain variability in burnout through various mediating processes (e.g., Vallerand, Paquet, Phillippe, & Charest, 2010). The current study extended previous research (Curran, Appleton, Hill, & Hall, 2011; Gustafsson, Hassmen, & Hassmen, 2011) by testing a model in which the effects of passion for sport on athlete burnout were mediated by psychological need satisfaction. One-hundred and seventy-three academy soccer players completed self-report measures of passion for sport, psychological need satisfaction, and athlete burnout. Results indicated that psychological need satisfaction mediated the relationship between harmonious passion and athlete burnout but not obsessive passion and athlete burnout. The findings indicate that the inverse relationship between harmonious passion and burnout can be explained by higher levels of psychological need satisfaction. However, this was not the case for obsessive passion, which was not associated with psychological need satisfaction and most symptoms of athlete burnout.

Key Words: Self-Determination Theory, Motivation, Sport, Harmonious Passion, Obsessive Passion.

1 Burnout is an experiential syndrome thought to manifest in a number of achievement
2 contexts (Schaufeli, Leiter, & Maslach, 2009). Initial investigation of burnout took place in
3 occupational settings (Freudenberger, 1975). More recently, researchers have begun to
4 examine burnout in athletes (e.g. Gould, Udry, Tuffey, & Loehr, 1996; Hill, Hall, Appleton,
5 & Kozub, 2008; Lemyre, Treasure, & Roberts, 2006). Athlete burnout is understood to be
6 both physically and psychologically debilitating (Gould & Diffenbach, 2002). For instance,
7 the syndrome is associated with poor performance, overtraining and depressed mood
8 (Brenner, 2007; Gould et al., 1996; Gustafsson, Hassmen, Kentta, & Johansson, 2008). In
9 light of recent suggestions that these consequences may be particularly severe in aspiring
10 athletes (see Gustafsson, Kentta, & Hassmen, 2011), investigation of the antecedents of
11 burnout in junior athletes may be especially important.

12 Although athlete burnout is characterised by a wide range of features, it is believed to
13 have at least three key dimensions (Raedeke, 1997; Raedeke & Smith, 2001). The first is a
14 reduced sense of athletic accomplishment. This encapsulates unfulfilled goals and
15 performances that are consistently perceived as discrepant from desired standards. The
16 second is emotional and physical exhaustion. This reflects a perceived depletion of energy
17 associated with the sustained demands of sport participation and a sense of constantly falling
18 short of performance standards. The third dimension is the experience of sport devaluation.
19 This represents a diminished interest in sports participation and a reduction in the
20 significance given to sporting achievement.

21 Researchers have employed a number of conceptual approaches in an attempt to
22 explain athlete burnout (see Cresswell & Eklund, 2006). These include stress-based models
23 (Smith, 1986), those grounded in psychological commitment (Schmidt & Stein, 1991), and
24 sociological explanations (Coakley, 1992). Recently, researchers have suggested that burnout
25 may be best understood from a motivational perspective (Cresswell & Eklund, 2005; Lemyre

1 et al., 2006). According to this approach, when the motivation underpinning participation in
2 sport shifts from enjoyment and personal mastery (viz. autonomous motivation) to obligation
3 and coercion (viz. controlled motivation), athletes become more likely to experience feelings
4 of helplessness (viz. amotivation) that underpin burnout. Consequently, researchers have
5 begun to pay special attention to individual differences that influence motivation among
6 athletes, such as the achievement goals (Lemyre et al., 2008), perfectionism (Appleton, Hill
7 & Hill, 2009; Hill et al., 2008) and passion for sport (Curran, Appleton, Hill, & Hill, 2011;
8 Gustafsson, Hassmen, & Hassmen, 2011).

9 **Passion for sport and athlete burnout**

10 Passion refers to a strong affinity toward self-defining activities that people value
11 highly and to which they dedicate large amounts of time and energy (Vallerand et al, 2003).
12 This affinity is thought to develop in a dualistic manner dependent on how the activity is
13 assimilated into the self-concept (Vallerand, 2008). Harmonious passion develops when the
14 reasons for engaging in sport are personally endorsed and are fully integrated into one's self-
15 concept (Mageau et al., 2009). An athlete would identify with harmonious passion when they
16 choose to participate in sport solely of their own accord, without any sense of obligation.
17 Obsessive passion, in contrast, develops when participation in sport is regulated by inner
18 contingencies, such as the desire to validate or protect of self-worth, and is only partially
19 integrated into one's self-concept (Mageau et al., 2009). An athlete would identify with
20 obsessive passion when they feel compelled or obligated to take part in sport.

21 A number of cognitive, affective and behavioural differences may be anticipated
22 depending on the type of passion that underpins participation in sport. Such differences
23 reflect the alternative origins of the behaviour that for harmonious passion is agentic and
24 volitional, but for obsessive passion reflects ego-invested self-structures (Hodgins & Knee,
25 2002; Vallerand, 2008). Research in sport has found, for instance, that harmonious passion is

1 positively associated with life satisfaction, positive affect and vitality. In contrast, obsessive
2 passion is positively associated with rigid persistence, life conflict, physical ill-health and
3 avoidant tendencies (see Vallerand, 2012, for review). These findings are indicative of
4 research in this area, which collectively suggests that harmonious passion is likely to be
5 adaptive for athletes, whereas obsessive passion may ultimately contribute to debilitating
6 consequences.

7 The divergent relationships between types of passion and sporting outcomes may
8 extend to athlete burnout. This is because harmonious passion encompasses types of
9 motivation (i.e. higher autonomous motivation and lower controlled motivation) resistant to
10 burnout, whereas obsessive passion encompasses types of motivation (i.e. higher controlled
11 motivation) indicative of the syndrome (Lonsdale, Hodge, & Rose, 2009). Some empirical
12 evidence, which supports this contention, has been generated from research in occupational
13 settings. For example, Vallerand and colleagues (Carbonneau, Vallerand, Fernet, & Guay,
14 2008; Vallerand, Paquet, Phillippe, & Charest, 2010) have observed an inverse relationship
15 between harmonious passion and burnout and a positive relationship between obsessive
16 passion and burnout in samples of teachers and nurses. Initial attempts to build on this
17 research in a sporting context have recently found that in young athletes harmonious passion
18 is inversely related to burnout, whereas obsessive passion is unrelated to burnout unless high
19 in comparison to harmonious passion (Curran et al., 2011; Gustafsson et al., 2011).

20 **The mediating role of basic psychological need satisfaction**

21 Given that the two types of passion for sport may make burnout more or less likely,
22 an important next step is to ascertain *why* by identifying potential mechanisms. According to
23 Vallerand et al. (2003), the relationships between types of passion and outcomes such as
24 burnout are indirect. This contention has received some empirical support outside of sport as
25 harmonious passion has been found to predict lower levels of burnout via increased life

1 satisfaction (Vallerand et al., 2010). Similarly, obsessive passion has been found to predict
2 higher levels of burnout through greater conflict with other life domains (Vallerand et al.,
3 2010). In sport, there is evidence that motivational constructs from self-determination theory
4 (SDT; Ryan & Deci, 2002), such as autonomous motivation, may mediate the passion-
5 burnout relationship and it has been suggested that other related constructs, such as basic
6 psychological need satisfaction, may also do so (Curran et al., 2011; Vallerand et al., 2006).

7 SDT is an organismic approach to human motivation, emotion, and personality
8 (Niemi, Ryan, & Deci, 2010). Within SDT, psychological integration, social wellness, and
9 physical health are determined by the satisfaction of psychological needs for autonomy (the
10 need to experience volition, self-direction, and choice), competence (the need to feel a sense
11 of efficacy), and relatedness (the need to feel loved, valued and connected with significant
12 others). The degree to which environmental features (e.g., coach and parent motivational
13 style) and personal qualities (e.g., goal contents and type of passion) satisfy, or thwart, these
14 fundamental needs determine the extent to which psychological wellness or ill-being is
15 experienced. In support of this notion, numerous studies have found a relationship between
16 psychological need satisfaction and indicators of positive adjustment in sport (see Ryan &
17 Deci, 2007 for review).

18 Adopting SDT, researchers have postulated that athlete burnout reflects psychological
19 ill-being and may manifest when basic psychological needs are not satisfied (Eklund &
20 Cresswell, 2007). This is because low psychological need satisfaction results in a pattern of
21 controlled motivation, and eventual amotivation, which characterises athlete burnout.
22 Consistent with this theorising, research has evidenced the negative association between
23 psychological need satisfaction and athlete burnout (Lonsdale, Hodge, & Rose, 2009; Hodge,
24 Lonsdale, & Ng, 2008; Perreault, Gaudreau, Lapointe, & Lacroix, 2007). Perreault et al
25 (2007), for example, noted that psychological need satisfaction inversely correlated with

1 burnout in high school student-athletes. Similarly, Hodge and colleagues (2008) observed
2 that a linear combination of psychological need fulfilment was negatively related to a linear
3 combination of burnout symptoms in junior male rugby players.

4 Although the importance of passion for sport and psychological need satisfaction in
5 the development of athlete burnout has recently been highlighted, their interplay has yet to be
6 considered. Based on a self-determination theory explanation of burnout, and recent evidence
7 that environmental features may contribute to burnout via psychological need satisfaction
8 (Aide, Duda, & Ntoumanis, 2012; Quested & Duda, 2011), it is possible that need
9 satisfaction mediates the passion–athlete burnout relationship. Harmonious passion should
10 energise sporting engagement that is conducive to psychological need satisfaction and
11 subsequently lower athlete burnout. This is because when participation in sport is
12 underpinned by harmonious passion, engagement is completely aligned with personal values
13 and other areas of an athlete’s life (i.e., “I want to play because the activity reflects qualities
14 that I like about myself”; Vallerand, 2008). Consequently, harmonious passion allows for a
15 greater sense of personal causation (Vallerand et al., 2003), perceptions of competence
16 (Vallerand et al., 2008), and satisfaction with inter-personal relationships (Phillippe,
17 Vallerand, Houliort, Lavigne, & Donahue, 2010) which provide resiliency to burnout.

18 Obsessive passion, in contrast, may be associated with higher levels of athlete burnout
19 as it does not readily facilitate the fulfilment of basic psychological needs. This is because
20 when participation in sport is underpinned by obsessive passion, engagement is fuelled by a
21 sense of compulsion (i.e., “I have to play because it is the only way that I will feel good about
22 myself”; Vallerand, 2008) that can conflict with other areas of an athlete’s life (e.g.,
23 commitment to friends and family; Sèguin-Lèvesque, Lalibertè, Pelletier, Blanchard, &
24 Vallerand, 2003; Vallerand, Ntoumanis, et al., 2010). As a result, obsessive passion is likely
25 to undermine a sense of personal control, the fulfilment of expectations, or satisfaction with

1 inter-personal relations (cf. Vallerand et al., 2006) and place athletes at risk to burnout.
2 Although no research has examined the relationship between passion and need satisfaction
3 inside sport, in other domains, harmonious passion has been found to predict higher
4 psychological need satisfaction, whereas obsessive passion has been found to be associated
5 with lower psychological need satisfaction (Przybylski, Weinstein, Ryan, & Rigby, 2009).
6 Consequently, research supports the possibility that psychological need satisfaction may
7 mediate the passion-athlete burnout relationship.

8 **The present study**

9 In summary, the purpose of the current study was to examine the mediating role of
10 psychological need satisfaction in relationships between types of passion for sport and athlete
11 burnout. It was hypothesised that harmonious passion would demonstrate a negative indirect
12 relationship with athlete burnout since this type of passion was expected to positively predict
13 psychological need satisfaction. Conversely, it was expected that obsessive passion would
14 exhibit a positive indirect relationship with athlete burnout due to lower levels of
15 psychological need satisfaction (see Figure 1).

16 **Method**

17 **Participants and procedure**

18 A convenience sample of 173 young male soccer players ($M = 15.46$, $s = 1.47$, range
19 = 13-18) attending professional soccer academies in the UK participated in this study.
20 Athletes reported playing soccer for an average of 9.45 years ($s = 2.47$) and representing their
21 current club for an average of 3.84 years ($s = 2.35$). Data collection took place in the
22 presence of the lead author at the beginning of training sessions on playing fields or
23 gymnasiums, or at the end of athlete education sessions in classroom settings. General
24 instructions were provided and athletes were given a multi-section questionnaire. Ethical

1 approval from a UK University Ethics Committee was obtained prior to commencement of
2 the project.

3 **Instruments**

4 **Passion for sport.** Passion for sport was measured using Vallerand et al's (2003)
5 Passion Scale. This inventory consists of two 6 item subscales measuring harmonious passion
6 (HP e.g. "Soccer is in harmony with other activities in my life") and obsessive passion (OP
7 e.g. "I have difficulties controlling my urge to participate in soccer"). Participants respond on
8 a Likert scale from 1 to 7 (1 = "not agree at all" and 7 = "very strongly agree"). The two
9 factor structure of the passion scale has been confirmed in previous research (Vallerand et al.,
10 2006) and has evidence to attest to its internal consistency (HP $\alpha = .76$ and OP $\alpha = .87$;
11 Gustafsson et al., 2011), as well as test-retest reliability (HP $r = .80$ and $r = .87$; Carbonneau
12 et al., 2008).

13 **Basic psychological need satisfaction.** Autonomy was measured using 6 items taken
14 from a scale developed by Standage, Duda, and Ntoumanis (2005). An example item is "I
15 have some choice in what I want to do in soccer". Competence was measured using 6 items
16 from the perceived competence subscale of the Intrinsic Motivation Inventory (McAuley,
17 Duncan & Tammen, 1989). Items include "effective" and "competent" and are prefaced by
18 the statement "within soccer I feel". Relatedness was assessed utilising the 5 items of Richer
19 and Vallerand's (1998) acceptance scale. Items are prefaced by "with the other members of
20 my team, I currently feel" and include "supported" and "valued". Participants responded to
21 all items on a Likert scale ranging from 1 to 7 (1 = "strongly disagree" and 7 = "strongly
22 agree"). A number of researchers have adopted these scales to capture psychological needs
23 and have provided evidence to support the use of the scales (e.g., Smith, Ntoumanis, Duda, &
24 Vansteenkiste, 2011; Smith, Ntoumanis, & Duda, 2007). For example, Smith et al (2007)
25 have provided evidence of their internal consistency (autonomy $\alpha = .80$, competence $\alpha = .76$,

1 and relatedness $\alpha = .88$) and concurrent validity (e.g., life satisfaction, positive affect and
 2 autonomy support). In the current study, a composite score of the three basic needs
 3 satisfaction was adopted. This approach replicates the approach of others in this area (e.g.
 4 Alvarez, Balaguer, Castillo, & Duda, 2009; Smith et al., 2007; Sebire, Standage &
 5 Vanseteenkiste, 2009) and is supported by both the strong positive correlations among the
 6 psychological needs (e.g. Lonsdale et al., 2009; Stebbings, Taylor, & Spray, 2011). It also
 7 agrees with negative correlations among all psychological needs and burnout symptoms (e.g.
 8 Hodge et al., 2008; Lonsdale et al., 2009; Quested & Duda, 2010).

9 **Athlete burnout.** In order to assess burnout, the Athlete Burnout Questionnaire
 10 (ABQ; Raedeke & Smith, 2001) was used. This multi-dimensional inventory consists of 15
 11 items that assess three dimensions of burnout; sport devaluation (DE e.g. “I have negative
 12 feelings towards soccer”), reduced sense of accomplishment (RA e.g. “I am not achieving
 13 much in soccer”) and emotional/physical exhaustion (EX e.g. “I am exhausted by the mental
 14 and physical demands of soccer” and “I feel physically worn out in soccer”). Athletes
 15 responded according to the degree to which each statement applied using a Likert scale
 16 ranging from 1 to 5 (1 = “almost never” and 5 = “almost always”). Raedeke and Smith (2001)
 17 found support for the validity and reliability of the ABQ. This includes evidence of their
 18 internal consistency (reduced accomplishment $\alpha = .84$, exhaustion $\alpha = .89$, and devaluation α
 19 $= .89$) and test–retest reliability (reduced accomplishment $r = .86$, exhaustion $= .92$, and
 20 devaluation $= .92$). Consistent with previous research (e.g. Lonsdale et al., 2009), individual
 21 burnout symptoms and total burnout were examined (see Schaufeli et al., 2009).

22 Results

23 Preliminary analysis

24 Prior to running the main analysis, the data were screened for missing values. There
 25 were 139 complete cases and 34 cases with incomplete data. For those with incomplete data,

1 the percentage of missing data was the equivalent of less than 2 items ($M = 1.20$, $s = 0.41$,
2 range 1–2). The probability of the pattern of missing values diverging from randomness was
3 greater than .05 (MCAR $\chi^2 = 941.25$, $DF = 1001$, $p = .09$), thus data missing completely at
4 random was inferred. Consequently, each missing item was replaced using the mean of the
5 each participant's available non-missing items from the relevant subscale. This method of
6 imputation is considered an appropriate strategy when the amount of missing data are low
7 and items are highly correlated (Graham, Cumsille, & Elek-Fisk, 2000). Inspection of the
8 distribution of the data indicated univariate and multivariate normality (Kline, 1998).

9 Reliability analysis (Cronbach's α) revealed that most of the instruments used to
10 measure each of the variables internally consistent ($>.70$ level, see Table 1; Tabachnick &
11 Fidell, 2007). The one exception was the reduced sense of athletic accomplishment subscale
12 ($\alpha = .64$). This scale was retained in the current study for two reasons. Firstly, scales with less
13 than 5 items often have distributions that fall below .70. Therefore, a more lenient criterion
14 (i.e. $>.60$) has been suggested for such circumstances (Lowenthal, 1996). Secondly, as an
15 alternative indicator of reliability, the average inter-item correlation ($r_{it} = .27$) for this
16 subscale suggested reasonable internal consistency.

17 **Bivariate and partial correlations**

18 Bivariate and partial correlations were presented in Table 1. Partial correlations
19 between types of passion for sport and other variables were presented due to the strong
20 correlation between the two passion components. This is common in previous research using
21 the passion scale (e.g., Donahue, Rip, & Vallerand, 2009; Mageau et al., 2009; Vallerand et
22 al., 2008). The bivariate correlations indicated that harmonious passion was negatively
23 related to all burnout dimensions and total burnout. Obsessive passion was unrelated to
24 exhaustion, devaluation and total burnout and negatively associated with reduced
25 accomplishment. Having controlled for harmonious passion, obsessive passion was unrelated

1 to all study variables. After controlling for the effects of obsessive passion, harmonious
2 passion was positively associated with composite need satisfaction and inversely associated
3 with reduced accomplishment, exhaustion and total burnout. Bivariate correlations indicated
4 that composite psychological need satisfaction was inversely associated with reduced
5 accomplishment, exhaustion, devaluation and total burnout. The partial correlations
6 represented small effects and the bivariate correlations ranged between small and large
7 effects (Cohen, 1988).

8 **Path analysis**

9 In order to test the hypothesised model (Figure 1), path analysis with maximum
10 likelihood estimation was conducted using AMOS version 18.0 (Arbuckle, 2007). Four
11 models were tested. Each model included two exogenous variables (harmonious and
12 obsessive passion), a single mediator variable (composite psychological need satisfaction)
13 and one endogenous variable (symptom of burnout or total burnout). A different endogenous
14 variable was employed in each model. These were reduced accomplishment, emotional and
15 physical exhaustion, sport devaluation and total burnout. Conventional cut-off criteria were
16 adopted to indicate adequate fit between the hypothesised model and the observed data (TLI
17 and CFI > .95, RMSEA < .06, SRMR < .08, $\chi^2/df < 3$; Hu & Bentler, 1999).

18 All models displayed adequate fit with the data (see Table 2). The path coefficient
19 between harmonious passion and psychological need satisfaction was significant in all
20 models ($\gamma = .20, p < .01$). The path coefficient between obsessive passion and psychological
21 need satisfaction was non-significant in all models ($\gamma = .04, p > .05$). The path coefficient
22 between psychological need satisfaction and burnout dimensions varied in size but was
23 negative in all models: reduced sense of accomplishment ($\beta = -.53, p < .01$), emotional and
24 physical exhaustion ($\beta = -.21, p < .01$), and sport devaluation ($\beta = -.31, p < .01$). The path
25 coefficient between composite psychological need satisfaction and total burnout was also

1 negative and significant ($\beta = -.42, p < .01$). The two types of passion accounted for 5% of
2 variance in psychological need satisfaction and psychological need satisfaction explained
3 between 4% and 28% of variance in burnout dimensions.

4 **Mediated effects**

5 To determine whether the mediated effects of types of passion for sport on athlete
6 burnout were statistically significant, the PRODCLIN (MacKinnon, Fritz, Williams, &
7 Lockwood, 2007) programme was used to calculate indirect effects and their 95% confidence
8 intervals. Indirect effects are considered significant when the 95% confidence intervals
9 exclude zero (see table 3). Indirect effects of harmonious passion on reduced accomplishment,
10 exhaustion, devaluation and total burnout met this criterion. Indirect effects of obsessive
11 passion on reduced accomplishment, emotional and physical exhaustion, devaluation and
12 total burnout included zero. The percentage of reduction in the total effect of harmonious
13 passion on dimensions of athlete burnout in the presence of composite psychological need
14 satisfaction ranged from 33.33 to 77.77% (see Table 3).

15 **Discussion**

16 The purpose of this study was to examine the mediating role of psychological need
17 satisfaction in relationships between types of passion for sport and athlete burnout. Based
18 upon self-determination theory (SDT; Ryan & Deci, 2002), it was hypothesised that
19 harmonious passion would have a negative indirect relationship with athlete burnout.
20 Conversely, it was hypothesized that obsessive passion would exhibit a positive indirect
21 relationship with athlete burnout. Examination of indirect effects supported the expected
22 mediating role of psychological need satisfaction in the relationship between harmonious
23 passion and dimensions of athlete burnout. However, the indirect effects of obsessive passion
24 on dimensions of athlete burnout were non-significant.

1 Before turning attention to the indirect effects, the passion-athlete burnout
2 relationship warrants some consideration. Harmonious passion was inversely related to a
3 reduced sense of athletic accomplishment, emotional and physical exhaustion and total
4 athlete burnout, but unrelated to sport devaluation (bivariate and partial correlations). These
5 findings largely support previous research examining passion and burnout inside and outside
6 of sport (Carbonneau et al., 2008; Curran et al., 2011; Gustafsson et al., 2011; Vallerand et al.,
7 2010). They also substantiate broader claims regarding the adaptive nature of participation in
8 sport when achievement striving is energised by harmonious passion (Vallerand, 2012). As
9 such, the current findings support the notion that athletes who exhibit a harmonious passion
10 are likely to experience reduced ill-being in sport.

11 With the exception of a small inverse bivariate correlation with a reduced sense of
12 accomplishment, obsessive passion was unrelated to dimensions of burnout (bivariate and
13 partial correlations). These findings are in contrast to the predictions of the dualistic model of
14 passion, which posits that this type of passion is likely to be problematic for athletes.
15 Research has now found support for a positive, negative and non-significant association
16 between this obsessive passion and dimensions of athlete burnout (Curran et al., 2011;
17 Gustafsson et al., 2011). It is possible that some features of obsessive passion, such as high
18 behavioural investment, are antithetical to the amotivation that most closely describes
19 burnout (Eklund & Cresswell, 2007). It is also possible that obsessive passion may have a
20 more complex relationship with burnout in achievement contexts. For example, there is some
21 evidence that this type of passion does not inhibit self-related positive affect (e.g. pride and
22 confidence) when the reasons for being passionate are fulfilled (Vallerand et al., 2010). The
23 inverse association between obsessive passion and reduced accomplishment in the current
24 sample alludes to this possibility. Identifying the conditions under which obsessive passion
25 may and may not contribute to burnout is therefore an importance avenue for future research.

1 **The mediated effects of passion for sport on athlete burnout through psychological need**
2 **satisfaction**

3 The indirect effects of harmonious passion on athlete burnout dimensions were
4 significant. When exhibiting harmonious passion, participation in sport is freely chosen and
5 as such does not interfere with an athlete's inner desire for self-determination. This allows
6 athletes to experience greater psychological need fulfilment, which tempers the likelihood of
7 burnout. It is noteworthy that these indirect effects were small (Cohen, 1988). However, as
8 they were statistically significant, and the percentage of the total effect accounted for by the
9 indirect effect was large, psychological need satisfaction warrants consideration alongside
10 previously identified variables as a potential mediating factor (see Carbonneau et al., 2008;
11 Curran et al., 2011; Vallerand et al., 2010). In addition, because psychological need
12 satisfaction plays an important role in relation to the other mediating pathways already
13 identified (viz. motivational regulation), its inclusion offers a more complete understanding
14 of the indirect effects of harmonious passion on athlete burnout (cf. Lonsdale et al., 2009).

15 The indirect effect of obsessive passion on athlete burnout through psychological
16 need satisfaction was not significant. This was due to the lack of association between
17 obsessive passion and psychological need satisfaction in the hypothesised model. When
18 considered alongside harmonious passion, it appears that obsessive passion exerts little
19 influence upon the satisfaction of autonomy, competence and relatedness in sport. Assuming
20 obsessive passion can contribute to athlete burnout, it is possible that it exerts its effects via
21 alternate, albeit associated, pathways. One such pathway may be through psychological need
22 thwarting. Psychological need thwarting occurs when individuals perceive obstructions to
23 autonomy, competence and relatedness, as opposed to low opportunity for psychological
24 need satisfaction (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011). Although
25 obsessive passion may have little impact on psychological need satisfaction, it is possible that

1 it may be more actively involved in the thwarting of psychological needs. In light of this
2 possibility, future research may wish to examine the passion-athlete burnout relationship
3 through psychological need thwarting.

4 In addition to this possibility, it is also likely that obsessive passion's negative
5 influence on psychological needs may take time to unfold. For example, while in the short-
6 term the effort energised by obsessive passion may contribute to perceptions of competence
7 (Bélanger, Lafrenière, Vallerand, & Kruglanski, 2012), following persistent goal blockage
8 and/or perceived failure, obsessive passion will lead to avoidant tendencies that eventually
9 undermine perceptions of competence (Vallerand, Mageau, Elliot, Dumais, Demers, &
10 Rousseau, 2008). Similarly, a deterioration in interpersonal relationships to the point at which
11 significant others are perceived to withdraw support may only arise when the rigid
12 persistence and conflict associated with this type of passion renders important social bonds
13 unsustainable (see Lafrenière, Jowett, Vallerand, Donahue & Lorimer, 2008). These
14 possibilities highlight the importance of monitoring the influence of the indirect effect of
15 obsessive passion over time in future research.

16 **Implications for practice**

17 The finding that harmonious passion may safeguard athletes from the development of
18 athlete burnout via psychological need satisfaction has a number of implications for practice.
19 Most notably, coaches, physical educators, parents and other important socialisers in sport
20 should promote sporting environments that emphasise harmonious tendencies. Two important
21 features of harmonious passion are volitional engagement and non-contingent self-esteem
22 (Vallerand et al., 2003). These features develop in environments that provide autonomy
23 support and unconditional regard (Mageau et al., 2009). Such environments can be cultivated
24 by acknowledging athletes' ideas, emphasising effort as opposed to normative success in
25 development and giving a meaningful rationale when rules or limits are imposed on

1 behaviour. Research suggests that coaches and physical educators can be taught to provide
2 autonomy support, and hallmarks of harmonious passion (i.e., volitional engagement, positive
3 affect and satisfaction) have been found to develop in such contexts (Edmunds, Ntoumanis,
4 & Duda, 2008; Tessier, Sarrazin, & Ntoumanis, 2010).

5 In the case of obsessive passion, few discernible effects on both psychological need
6 satisfaction and athlete burnout were found in the current study. Nevertheless, there is
7 substantial evidence that attests to the maladaptive nature of obsessive passion for athletes
8 (see Vallerand, 2012). Practitioners should therefore seek to manage and avoid the
9 development of obsessive passion. Obsessive passion primarily develops in response to a
10 burgeoning sense of conditional regard in achievement contexts (cf. Assor, Roth & Deci,
11 2004). Coaches display this conditional regard when they exhibit passivity towards athletes
12 after failure or use negative affect-laden expressions and guilt inducement to convey their
13 disappointment (e.g., “you let me down”). Consequently, in addition to promoting autonomy
14 support, coaches should reduce behaviours that contribute to perceptions of conditional
15 acceptance among their athletes.

16 **Limitations and additional future research**

17 The findings from this study should be considered in the context of its limitations.
18 First, the sample reported relatively low levels of athlete burnout. It is worth noting that the
19 levels of burnout reported here are similar to other studies (e.g. Appleton et al., 2009;
20 Gustafsson, Hassmén, & Podlog, 2010; Hill et al., 2008), which may reflect either a low
21 prevalence of athlete burnout in the population or a broader tendency to recruit healthy
22 samples. Insofar as samples demonstrate variability in athlete burnout symptoms, though, the
23 examination of antecedents and processes that contribute to burnout is appropriate. Moreover,
24 while research in this area would benefit from samples which report higher levels of burnout,

1 establishing the factors that increase the likelihood of higher levels of burnout symptoms
2 among youth sport participants remains an important focus for research.

3 Second, a cross-sectional design was employed and therefore causality cannot be
4 inferred between the measured variables. The lack of a temporal component in the current
5 study is particularly important for research interested in passion for sport and athlete burnout
6 because the relationships will take time to unfold (Vallerand et al., 2010). It is also possible
7 that passion for sport and psychological need satisfaction share a reciprocal relationship and
8 this interchange may be particularly pronounced in an athlete's formative years before an
9 activity becomes self-defining (cf. Mageau et al., 2009). Longitudinal designs will help
10 disentangle this relationship. In doing so, research can also examine alternative mediating
11 pathways through individual psychological needs which may offer further insight in to the
12 development of athlete burnout (see Adie et al., 2012; Quedsted & Duda, 2011).

13 Third, the internal consistency of the reduced accomplishment scale was notably
14 lower than for the other scales employed in the study. Although it is generally not the case,
15 there are other instances when subscales of the ABQ have exhibited lower levels of internal
16 reliability (e.g., devaluation; Lemyre, Roberts, & Stray-Gunderson, 2007). While shorter
17 scales are more likely to have lower levels of internal reliability (as assessed by Cronbach's
18 alpha), less reliable scales has a number of implications. Especially relevant here is the
19 potential to attenuate the relationships between variables and, in turn, reduce indirect effects
20 (Pedhazur, 1997). As a consequence, the non-significant indirect effect of obsessive passion
21 on reduced accomplishment could be attributed, in part, to the lower reliability of the reduced
22 accomplishment scale. However, it is more likely to reflect the lack of association between
23 obsessive passion and need satisfaction.

24 **Conclusion**

1 The results of this study extend our understanding of the likely antecedents and
2 psychological processes that contribute to burnout. Consistent with the predictions of the
3 dualistic model of passion, the findings underscore the importance of harmonious passion in
4 tempering athletes' experiences of burnout. Furthermore, the findings suggest that the inverse
5 relationship between harmonious passion and athlete burnout may be, in part, attributable to
6 higher levels of psychological need satisfaction. By contrast, little direct and no indirect
7 relationship was observed between obsessive passion and athlete burnout. However, given its
8 pervasive impact evident elsewhere, it is possible that the influence of obsessive passion on
9 athlete burnout may not be immediately apparent but will instead unfold overtime.

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Table 1. Descriptive statistics and bivariate and partial correlation coefficients between passion, composite need satisfaction, dimensions of athlete burnout, and total burnout.

	1	2	3	4	5	6	7	<i>M</i> (<i>SD</i>)	α
1. Harmonious passion	---		.16 *	-.17 *	-.17 *	-.07	-.17 *	5.24 (0.96)	.78
2. Obsessive passion	.67 **	---	.03	.02	.11	.02	.06	4.64 (1.19)	.79
3. Total need satisfaction	.23 **	.17 *	---					5.34 (0.74)	.84
4. Reduced accomplishment	-.21 **	-.13 *	-.57 **	---				2.10 (0.62)	.64
5. Exhaustion	-.12 *	-.00	-.21 **	.39 **	---			2.37 (0.70)	.78
6. Devaluation	-.09	-.04	-.31 **	.58 **	.48 **	---		1.59 (0.72)	.81
7. Total burnout	-.17 *	-.07	-.42 **	.79 **	.78 **	.86 **	---	2.00 (0.55)	.86

Note. Partial correlations appear above the diagonal, and bivariate correlations appear below the diagonal. ** $p < .01$, * $p < .05$.

Table 2. Fit of structural models and standardised path coefficients for structural models.

ABO	Variance Explained	Model fit					PA → NS		NS → ABO	
	r^2	χ^2 (d.f)	χ^2 /d.f	TLI	CFI	SRMR	RMSEA (90% CI)	HP (a_1)	OP (a_2)	(b)
RA	.28	2.37 (2)	1.18	.99	.99	.03	.15 (.00 to .16)	.20**	.04	-.53**
EX	.04	3.47 (2)	1.73	.98	.96	.03	.10 (.00 to .18)	.20**	.04	-.21**
DE	.10	0.16 (2)	0.08	1.00	1.00	.01	.00 (.00 to .05)	.20**	.04	-.31**
TB	.18	2.25 (2)	1.12	.99	.99	.03	.03 (.00 to .16)	.20**	.04	-.42**

Note: χ^2 = Chi square; d.f = Degrees of freedom; TLI = Tucker Lewis index; CFI = Comparative fit index; SRMR = Standardised root mean square residual; RMSEA = Root mean squared error of approximation; RA = Reduced accomplishment; EX = Emotional and physical exhaustion; DE = Devaluation; TB = Total burnout; PA = Passion, NS = Composite Psychological need satisfaction; ABO = Athlete burnout; HP = Harmonious passion; OP = Obsessive passion; ** $p < .01$.

Table 3. Analyses of mediation for harmonious passion and indirect effects.

ABO	Total Effects			Indirect Effect HP → NS → ABO	Indirect Effect OP → NS → ABO
	<i>b</i> (YX)	<i>b</i> (YX.M)	% Change	<i>ab</i> (95% CI)	<i>ab</i> (95% CI)
RA	-.21**	-.10	-52.38	-.07 (-.20 to -.03)	-.01 (.04 to -.07)
EX	-.12	-.08	-33.33	-.03 (-.10 to -.01)	-.01 (.02 to -.03)
DE	-.09	-.02	-77.78	-.05 (-.13 to -.02)	-.01 (.03 to -.05)
TB	-.17*	-.08	-52.94	-.05 (-.16 to -.02)	-.01 (.03 to -.05)

Note: *b*(YX) = the total effect of the harmonious passion on the dimension of athlete burnout; *b*(YX.M) = the total effect of the harmonious passion on the dimension of athlete burnout, controlling for composite psychological need satisfaction. RA = Reduced accomplishment; EX = Emotional and physical exhaustion; DE = Devaluation; TB = Total burnout. The 95% confidence intervals for the indirect effects were those derived from the *PRODCLIN* programme that produces confidence intervals on the basis of a distribution-of-the-product-method (Mackinnon et al., 2007). ** $p < .01$, * $p < .05$.

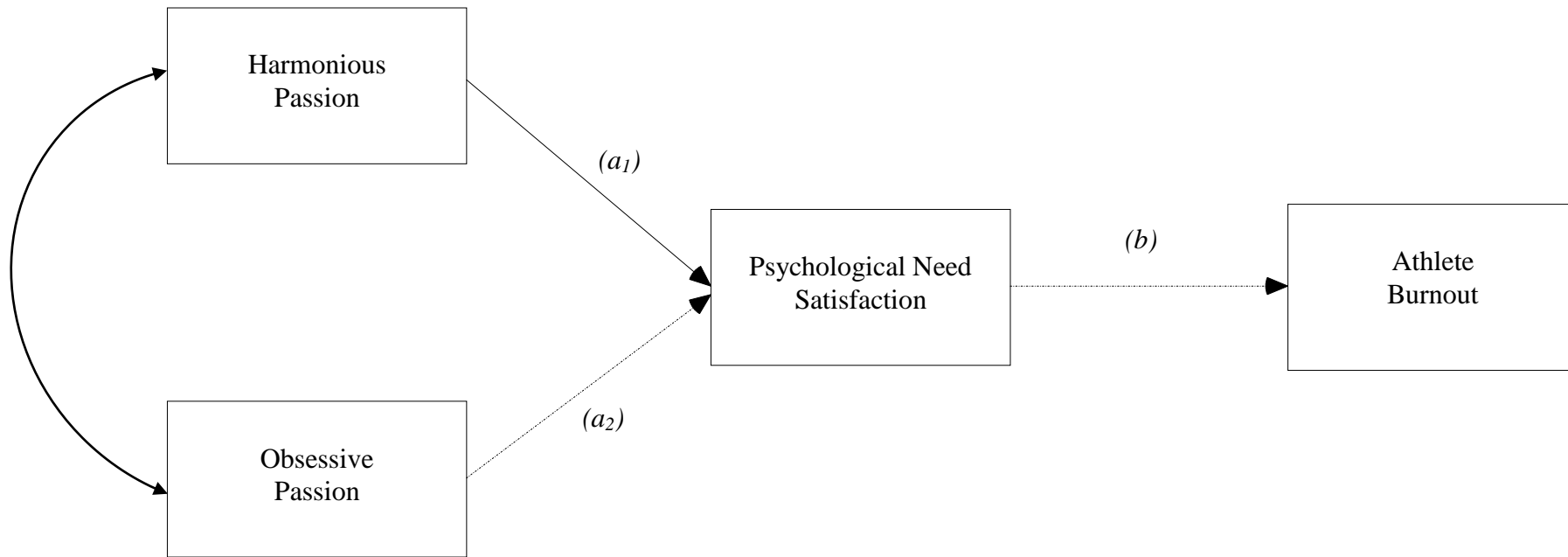


Figure 1. Hypothesised path model of passion, basic psychological need satisfaction and athlete burnout. Path letters denote paths in Table 2. Note; dashed lines indicate a hypothesised negative relationship; the un-dashed line indicates a positive relationship.